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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,932	09/14/2006	Kaoru Narita	NEC P16165	2204

27667 7590 05/24/2010

HAYES SOLOWAY P.C.
3450 E. SUNRISE DRIVE, SUITE 140
TUCSON, AZ 85718

EXAMINER	
GLENN, KIMBERLY E	

ART UNIT	PAPER NUMBER
2817	

NOTIFICATION DATE	DELIVERY MODE
05/24/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

admin@hayes-soloway.com
smckniff@hayes-soloway.com
nsoloway@hayes-soloway.com

Office Action Summary	Application No.	Applicant(s)	
	10/598,932	NARITA, KAORU	
	Examiner	Art Unit	
	KIMBERLY E. GLENN	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-9,11,12,18,20,21,23 and 114* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7,12,14-18,20,21 and 23* is/are rejected.

7)☒ Claim(s) *8 9 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

After further consideration of the claims, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3, 12, 14-18, 20, 21 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant discloses a “printed wiring board” in line 2. Is applicant referring the "printed circuit board” recited in claim 1 or a different board?

Claim 12 and 20 recites the limitation "the input/output circuits" in lines 2 and 3 respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 4, 5, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) figure 1 in view of Gruchalla et al US Patent 5,157,361 (of record).

AAPA disclose a circuit comprising a general transmission line 1 serving as a data bus connecting input/output circuits 3 present in plurality integrated circuit chips 2. The transmission lines transmit data between the integrated circuits.

Thus, AAPA is shown to teach all the limitation of the claims with the exception of the transmission line having an element that changes an effective reactance per unit length depending on at least one of a signal voltage and a signal current and the integrated circuit and said transmission line being formed on a signal printed circuit board. .

Gruchalla et al discloses in figure 1 a nonlinear transmission line comprising electrodes 14 and 16 and dielectric formed by the depletion region 18. The dielectric 18 is surrounding by region 22 and 24 which are doped to comprise a semiconductor diode. The regions 22 and 24 isolated the electrodes from the dielectric. The capacitance per unit length of transmission line formed by electrodes and the dielectric is a function of the signal voltage applied across the electrodes. A signal source 12 is applied across electrodes 14 and 16 therefore inherently one electrode with function a signal conductor and the other electrode will function as a reference (i.e. ground) conductor. Since one electrode 16 is connected to ground and the other electrode is placed above the ground electrode separated by an insulating material, the entire structure taken as a whole can be considered a printed circuit board. Therefore, one of ordinary skill in the art would have found it obvious to replace the general transmission line of AAPA with a nonlinear transmission line as taught by Gruchalla et al.

The motivation for this modification would have been to provide a transmission line with the advantageous benefit of generating signals exhibiting fast transition times and wherein the signals have high signal amplitude. (Column 1; line 62-65)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the integrated circuit and said transmission line being formed on a signal printed circuit board, since it has been held that the use of a one piece construction instead of the multiple piece construction as disclosed in AAPA, would be merely be a matter of design choice. In re Larson, 340 F. 2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) figure 1 in view of Gruchalla et al US Patent 5,157,361 (of record) in further view of McSweeney US Patent 4,858,066.

The above 35 U.S.C 103(a) rejection discusses the AAPA and Gruchalla et al references.

Thus, AAPA and Gruchalla et al are shown to teach all the limitation of the claims with the exception the dielectric exhibiting a nonlinear relationship between an electric field and a dielectric polarization generated in the dielectric.

McSweeney discloses a nonlinear dielectric composed of ferroelectric $Pb(Mg_{0.33}\ Nb_{0.67})O_3$ --$PbTiO_3$ --$Pb(Me_{0.50}\ W_{0.50})O_3$ wherein Me represents Mg Zn or Ni. (Column 5; lines 13-300 McSweeney discloses that this nonlinear polarization behavior is due directly to electric field -induced domain switching. (Column 3; lines 42-43)

Therefore, one of ordinary skill in the art would have found it obvious to substitute the general dielectric of Gruchalla with the ferroelectric dielectric as taught by McSweeney.

The motivation for this modification would have been to provide a dielectric with low coercive field value, high remanent polarization, high dielectric strength, and high curie temperature. (Column 1; lines 60-64)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) figure 1 in view of Gruchalla et al US Patent 5,157,361. (Of record)

AAPA disclose a circuit comprising a general transmission line 1 serving as a data bus connecting input/output circuits 3 present in plurality integrated circuit chips 2. The transmission lines transmit data between the integrated circuits.

Thus, AAPA is shown to teach all the limitation of the claims with the exception of the transmission line having an element that changes an effective reactance per unit length depending on at least one of a signal voltage and a signal current and the integrated circuit and said transmission line being formed on a signal printed circuit board.

Gruchalla et al discloses in figure 8, a nonlinear transmission line comprising a center conductor 90 with two conductive planes 92 and 94 one above and one below the center conductor and semiconductor substrate 96. A nonlinear structure as shown in figure 1 may be provided between the center conductor and each of the conductive planes or between the center conductor and only one of the conductive the planes. The nonlinear transmission line as shown in figure 1 comprises dielectric depletion region 18. The dielectric depletion region is surrounded by region 22 and 24 which are doped to comprise a semiconductor diode. The regions 22 and 24 isolated the electrodes from the dielectric. The capacitance per unit length of transmission line formed by electrodes and the dielectric is a function of the signal voltage applied across the electrodes. A signal source 12 is applied across electrodes 14 and 16 therefore inherently one electrode with function a signal conductor and the other electrode will function as a reference (i.e. ground) conductor. Since one electrode 16 is connected to ground and the other electrode is placed above the ground electrode separated by an insulating material, the entire structure taken as a whole can be considered a printed circuit board. Therefore, one of ordinary skill in the art would have found it obvious to replace the

general transmission line of AAPA with a nonlinear transmission line as taught by Gruchalla et al.

The motivation for this modification would have been to provide a transmission line with the advantageous benefit of generating signals exhibiting fast transition times and wherein the signals have high signal amplitude. (Column 1; line 62-65)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) figure 1 in view of Gruchalla et al US Patent 5,157,361 (of record) in further view of McSweeney US Patent 4,858,066.

The above 35 U.S.C 103(a) rejection of claims 12 and 14 discusses the AAPA and Gruchalla et al references.

Thus, AAPA and Gruchalla et al are shown to teach all the limitation of the claims with the exception the dielectric exhibiting a nonlinear relationship between an electric field and a dielectric polarization generated in the dielectric.

McSweeney discloses a nonlinear dielectric composed of ferroelectric $Pb(Mg_{0.33}\ Nb_{0.67})O_3$ --$PbTiO_3$ --$Pb(Me_{0.50}\ W_{0.50})O_3$ wherein Me represents Mg Zn or Ni. (Column 5; lines 13-300 McSweeney discloses that this nonlinear polarization behavior is due directly to electric field -induced domain switching. (Column 3; lines 42-43)

Therefore, one of ordinary skill in the art would have found it obvious to substitute the general dielectric of Gruchalla with the ferroelectric dielectric as taught by McSweeney.

The motivation for this modification would have been to provide a dielectric with low coercive field value, high remanent polarization, high dielectric strength, and high curie temperature. (Column 1; lines 60-64)

Allowable Subject Matter

Claims 8, 9 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 1, 4, 5, 12, 14, 24 and 25 have been considered but are moot in view of the new ground(s) of rejection. The new rejection is based on prior art references that were present before. After further consideration it was determined that the Gruchalla et al reference does teach the nonlinear transmission line being composed in printed circuit board. A printed circuit board is defined as a flat board that holds chip and other electric components in layers that interconnect via conductive pathways, often called traces. Therefore, the nonlinear transmission line disclosed in figures 1 and 8 can be considered printed circuit boards.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMBERLY E. GLENN whose telephone number is (571)272-1761. The examiner can normally be reached on Monday-Friday 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571)-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kimberly E Glenn
Examiner
Art Unit 2817

May 17, 2010
/K. E. G./
Examiner, Art Unit 2817

/Robert Pascal/
Supervisory Patent Examiner, Art Unit 2817